REMARKS

Claims 32-52 are pending in the application. Claims 32-52 stand rejected. Claims 32-41 are being cancelled to expedite prosecution of the application. Applicants reserve the right to file the cancelled claims in a continuing application. Independent claims 42 and 48 are being amended.

In parts 1 and 2 of the Office Action, Claims 42, 46, 48, and 51 were rejected under 35 U.S.C. §102(b) as being anticipated by Ozaki (U.S. Patent No. 5,502,749), hereinafter referenced as "Ozaki."

In part 3 of the Office Action, Claims 32-35 and 37-40 were rejected under 35 U.S.C. §102(e) as being anticipated by, or alternatively, under 35 U.S.C. §103(a) as being obvious over Takashima (U.S. Patent No. 5,708,662), hereinafter referenced as "Takashima."

Claims 36 and 41 were rejected under 35 U.S.C. §103(a) as being unpatentable over Takashima, in view of Suzuki (U.S. Patent No. 5,077,727), hereinafter referenced as "Suzuki."

Claims 43, 44 and 50 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ozaki, in view of Nakano (U.S. Patent No. 5,559,789), hereinafter referenced as "Nakano."

Claim 45 was rejected under 35 U.S.C. §103(a) as being unpatentable over Ozaki, in view of Nakano, and further in view of Ojanpera (U.S. Patent No.5,703,873), hereinafter referenced as "Ojanpera."

Claims 47, 49 and 52 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ozaki, in view of Hill (U.S. Patent No. 3,795,772), hereinafter referenced as "Hill."

Remarks regarding Rejections under 35 U.S.C. §102(b)

Claim 42 as amended in the Claim Listing above recites,

> A method for managing a signal, comprising:
> searching for a pilot tone by scanning a frequency range in predetermined frequency steps;
> recovering a pilot tone sub-symbol;
> calculating a parameter value difference between the pilot tone sub-symbol and a consecutive pilot tone sub-symbol; and
> adjusting a clock signal frequency depending on the parameter value difference to lock on a phase and frequency of the pilot tone.

where the strikethrough words indicate elements being deleted by way of amendment, and the underlined words indicate elements being added by way of amendment. Support for the amendment is found in the specification as originally filed at least on page 13, paragraph bridging pages 13 and 14, which states:

> The receiver scans the frequency range of the bins transmitted by the transmitter 97 in predetermined frequency steps looking for the bin containing the pilot tone. Once the bin containing the pilot tone sub-symbol has been identified, the receiver 150 makes a gross timing adjustment of the output signal of voltage controlled oscillator 240 to receive the bin including the pilot tone sub-symbol in the correct predetermined bin location.

and also on Page 13, line 7, which states

> The eventual goal is to "lock on" to the exact phase and frequency of the pilot tone.

Referring to the application as originally filed on pages 8 through 50, the Applicants introduce a method for synchronizing the clocks used in a transmitter and receiver of an Orthogonal Frequency Division Multiplexing (OFDM), Discrete Multi-Tone (DMT) digital communication system. The communication system includes a transmitter for "transmitting OFDM/DMT symbols over a predetermined number of bins across a transmission medium." At least one of these bins contains pilot tone sub-symbols that are generated from the pilot tone. The communication system also includes a receiver for receiving the pilot tone sub-symbols. The receiver operates based on a two-stage process. In the first stage, the receiver scans the frequency range of the predetermined number of bins to search for and identify the bins containing pilot tone sub-symbols. In the second stage the receiver adjusts the timing signal to receive the identified bin containing the sub-symbol. In this stage, the receiver also measures the phase differences between successive pilot symbols. The measured phase difference is then used to adjust the timing signal to ensure that the pilot tone sub-symbol is received within a frequency range suitable for subsequent phase locked loop processing.

Specifically, referring to the application as originally filed on page 13, paragraph bridging pages 13 and 14

> The entire pilot tone acquisition procedure can be viewed as a two stage process comprising search and acquisition of the pilot tone. To this end, the receiver 150 operates in accordance with at least two modes of operation. In a first pilot tone

> search mode of operation, the receiver scans the frequency range of the bins transmitted by the transmitter 97 in predetermined frequency steps looking for the bin containing the pilot tone. Once the bin containing the pilot tone sub-symbol has been identified, the receiver 150 makes a gross timing adjustment of the output signal of voltage controlled oscillator 240 to receive the bin including the pilot tone sub-symbol in the correct predetermined bin location. In a subsequently occurring second pilot tone acquisition mode, the receiver 150 also measures the phase difference between consecutive pilot tone sub-symbols to adjust the timing of the output of the voltage controlled oscillator 240 so that it is within a frequency range sufficient for subsequent phase locked loop processing of the pilot tone signal. After this acquisition has taken place, the receiver 150 switches to a steady state tracking mode in which the phase locked loop is used to constantly maintain synchronism with the transmitter 97.

After completing the two stage process, the system enters a mode in which it "locks on the exact phase and frequency of the pilot tone".

In contrast, Ozaki introduces a radio receiver device containing a first and second phase shift information detection units. The first detection unit is placed to detect a first phase shift information of the received data. The second detection unit shifts the phase of the received data to detect second phase shift. The phase shift is corrected by comparing the output signals from the first and second phase shift detection units. As Ozaki describes in Column 2, line 65 to Column 3, line 10

> The first phase shift information detection unit detects first phase shift information of the received data with respect to data processed by the received data processing unit on the basis of the reference patten. The second phase shift information detection unit shifts the phase of the received data to detect second phase shift information of the received data with respect to the processed data received from the received data processing unit on the basis of the reference pattern. The radio receiving unit corrects the phase shift of the received data, based on a comparison of the output signals from the first phase shift detection unit and the second phase shift detection unit.

Additionally, in Column 9, lines 36-41

> Therefore, the central processing unit 15 detects the phase shift direction and the phase shift correction amount and delivers a control command to the phase correction circuit 24 based on such detection result to correct the phase shift, and then proceeds to step SP12 to terminate the processing procedure.

Thus, Ozaki merely describes a two stage phase correcting method. Although both Ozaki and the Applicants employ a two stage method, the underlying procedures are significantly different. Specifically, Ozaki detects first phase shift information in the first phase shift information unit and second phase shift information in the second phase shift information unit. The phase shift is corrected by comparing the output signals of the first and second phase shifts units.

Applicants' invention of amended claim 42 distinguishes over Ozaki for multiple reasons. Specifically, in the first pilot tone search mode of operation, Applicants' receiver scans the frequency range of the bins transmitted in predetermined frequency steps. In the second pilot tone acquisition mode, the receiver measures the differences between consecutive pilot tone sub-symbols to adjust the timing of the output. Upon completion of this acquisition, the receiver switches to a steady state tracking mode, where the phase locked loop is used to constantly maintain synchronism within the transmitter. In contrast to the Applicants' amended Claim 42, Ozaki's system neither discloses scanning the frequency range of the bins transmitted in predetermined frequency steps nor does Ozaki's system contain the means to lock on a phase and frequency of the pilot tone.

Accordingly, Applicants respectfully submit that the rejection of amended claim 42 under 35 U.S.C. §102(b) is overcome.

Independent claim 48 is being amended to include the same elements as amended claim 42. Accordingly, Applicants respectfully submit that claim 48 overcomes the rejection under 35 U.S.C. §102(b) for the reasons presented above.

Accordingly, Applicants respectfully submit that because Claims 46 and 51 depend from base Claims 42 and 48, these dependent claims should be allowed for at least the same reasons as the base claims from which they depend.

Reconsideration and withdrawal of the rejections are respectfully requested.

Remarks regarding Rejections under 35 U.S.C. §103(a)

Rejected claims 43, 44, 45, 47, 49, 50, and 52 depend from base Claims 42 or 48. As explained above, Ozaki does not teach all of the limitations in now amended base claims 42 and 48. These limitations of Ozaki are not cured by Nakano, Ojanpera, or Hill. Therefore, without

discussing the merits of the reasons for rejecting these claims in view of the references, it is Applicants' position that claims 43, 44, 45, 47, 49, 50, and 52 are allowable over Ozaki in view of Nakano, Ojanpera, or Hill. Applicants respectfully request rejection of Claims 43, 44, 45, 47, 49, 50, and 52 under 35 U.S.C. §103(a) be withdrawn.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims that will be pending after entry of this amendment, claims 42-52, are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By Mark B Solomon

Mark B. Solomon
Registration No. 44,348
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133
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